

REMARKS/ARGUMENTS

Claims Status

Claims 1-4, and 10-17 are pending. Claims 5-9 have been cancelled without prejudice. Claims 10-17 are new. Claims 1-4 have been amended for improved readability. Currently amended Claims 1-4 find support, for example, in the Claims as originally filed. Additionally, currently amended Claim 1 finds support, for example, in paragraph [0019] of the published Specification and in the Use Examples, all of which directly subject the gas to treatment by the catalyst. The lower ranges of new Claims 10 and 11 find support, for example, in Example 31 and Example 11, respectively. New Claim 12 finds support, for example, in original Claim 1. New Claim 13 finds support, for example, in Use Example 11. New Claims 14-17 find support, for example, in paragraph [0017] of the published Specification.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Rejection of Claim 7 under 35 U.S.C. §102(b)

Claim 7 has been cancelled, obviating this rejection.

II. Rejection of Claims 1-11 under 35 U.S.C. §103(a)

Claim 1 is directed towards a method of removing at least one sulfur compound from at least one hydrocarbon-comprising gas for preparation of hydrogen for operation of a fuel cell, comprising directly treating the at least one hydrocarbon-comprising gas comprising the at least one sulfur compound with a catalyst at 15 to 40°C under atmospheric pressure, wherein the catalyst comprises: from 5 to 70% by weight of at least one selected from the group consisting of copper, silver, zinc, molybdenum, iron, cobalt, and nickel; and from 30 to 95% by weight of at least one oxide selected from the group consisting of magnesium,

calcium, scandium, yttrium, lanthanum, titanium, zirconium, chromium, tungsten, boron, aluminum, gallium, silicon, germanium, and tin; the catalyst excluding activated carbon and zeolites.

Claims 1-7 have been rejected as obvious in light of Example 2 of U.S. Patent No. 5,985,227 to Immel, et al. (Immel).

The method of Immel involves: (1) treating an industrial gas comprising sulfur compounds with steam; (2) passing the steam/gas mixture over a catalyst of at least three metal oxides; and (3) oxidizing the resulting gas with air and/or oxygen. *See*, col. 3, lines 10-23. The Immel process gives H₂S and a sulfur-loaded catalyst which should “be regenerated, preferably with steam, to remove the sulfur formed in [(3)] from the catalyst.” *See*, col. 3, lines 21-23. The only process example in Immel requires these steps (see, col. 5, lines 49-67).

Applicants respectfully submit that the present invention advances the art by not requiring above steps (1) and (3). While the method of Immel requires steam, the method of the present invention does not--it directly treats the hydrocarbon-comprising gas by contacting it with the catalyst. The direct treatment of Claim 1 precludes a pre-treatment of the gas with steam, as in the different process of Immel. *See*, the present Use Examples, and Immel, col. 5, lines 49-67. To this effect, new Claims 14-17 are directed to particularly preferred gases which are not treated with, nor comprise, steam before passage over the catalyst. Also, while the method of Immel generates H₂S, due to the presence of steam, the present invention does not. The process of the present invention is therefore different, simpler, and better than the process of Immel, to achieve the removal of at least one sulfur compound from at least one hydrocarbon gas. *See*, Specification, paragraphs [0028] - [0030]. As such, the process of the present invention is not obvious to the person having ordinary skill in the art based on Immel.

As stated above, Immel uses a prior step involving steam and a subsequent step involving an oxidizing gas, to carry out a different process. New Claim 12 of the present invention, which excludes both of Immel's pre-treatment **and** post-treatment with steam and an oxidizing gas stream, **and** does not create H₂S, is clearly distinct and not obvious from the 3-step process of Immel.

New Claims 10 and 11, which depend from Claim 1 and further limit the scope of the catalyst composition as supported by the Examples, are also non-obvious in light of Immel. As Immel provides only examples comprising between 1.45% to 1.98% of the named metals, new Claims 10 and 11 are well beyond the composition ranges disclosed therein.

Applicants therefore respectfully request that the obviousness rejection over Immel be withdrawn.

Summary

Applicants submit that the amendments to and cancellation of Claims have addressed the Examiner's rejections and that the application is now in condition for allowance.

Applicants respectfully request withdrawal of the rejections and passage of the case to issue.

Respectfully submitted,

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